

12
12
The South Equine Series
with the Author's Kind regards

FIRST REPORT

OF THE

CHOLERA HOSPITAL, ALBION STREET, GLASGOW.

BY

J. ADAIR LAWRIE, M.D., *Phys. Surg.*

PHYSICIAN TO THE HOSPITAL, AND PROFESSOR OF SURGERY, ANDERSONIAN UNIVERSITY.

FROM THE GLASGOW MEDICAL JOURNAL OF AUGUST, 1832.

REF. 8. 780933

REPORT, &c.

PREVIOUS to the appearance of cholera in Glasgow, the Board of Health, anticipating an extensive diffusion of the disease among our crowded population, had five Hospitals in readiness for the reception of patients. Happily, all calculations as to the probable extent of the epidemic in Glasgow, have been falsified by the result, and the Albion Street Hospital has been found capable of containing all within the royalty willing to avail themselves of hospital relief. To this Hospital, the Board of Health did me the honour to appoint me physician, and as its journals contain very accurate information on many points of the disease as it appeared in Glasgow, I trust I need not apologize for the appearance of the following report.

The first case of cholera reported in Glasgow was sent to the Albion Street Hospital, on the evening of Sunday, 12th February, from which date, to July 1st, there have been admitted 455 patients—of these, 318 have died, and 137 recovered, the percentage of deaths being nearly $69\frac{2}{3}$, and of recoveries $30\frac{1}{9}$; or the deaths to the recoveries as $2\frac{1}{3}$ to 1, or 7 to 3 nearly.

Of the admissions, 153 were males, and 302 females.

Of the 153 males, 112 died, and 41 recovered, the percentage of deaths being 73.2, of recoveries 26.8. Nearly as $2\frac{1}{2}$ to 1, or 7 to 2 $\frac{1}{2}$.

Of the 302 females, 206 died, and 96 recovered; the percentage of deaths, being 68.216; of recoveries, 31.784—or nearly as $2\frac{1}{7}$ to 1.

The following table shows the number of seizures, and the results at different periods of life:

AGES.	No.	Proportion to whole.	Died.	Recov- ered.	Proportion of Deaths to Recoveries.
Under 7 years of age, .	30	$\frac{1}{15}$ nearly	18	12	3 to 2
From 7 to 20 do., .	50	$\frac{1}{9}$.	28	22	14 — 11
— 20 to 30 do., .	102	$\frac{2}{9}$.	53	49	13 — 12
— 30 to 40 do., .	105	$\frac{3}{13}$.	81	24	10 — 3
— 40 to 50 do., .	74	$\frac{1}{6}$.	52	22	7 — 3
— 50 to 60 do., .	58	$\frac{2}{12}$.	51	7	$7\frac{1}{3}$ — 1
— 60 and upwards, .	36	$\frac{1}{12}$.	35	1	35 — 1

The above calculations, in so far as they go, show, that females in Glasgow are more liable to the disease than males—that the proportion of deaths among the males is greater than among the females—that comparatively few young persons have been affected—that even in hospital, nearly one-half of those between twenty and thirty recover, and that few or none beyond sixty survive. The only anomaly in the table, is the greater proportion of recoveries between forty and fifty, than between thirty and forty: [Of the 318 deaths, 231 perished in the collapsed and rallying stages, before the establishment of any marked symptom, and 87 in secondary fever or with discharges of blood from the intestines. Of the 137 cured, 85 were mild cases requiring little or no treatment, and 52 were severe. Comparing the severe cases which recovered with the number of deaths, we have 318 to 52, or $6\frac{1}{8}$ to 1. It would thus appear that under a severe form of cholera the chances against recovery are 6 or 7 to 1; and this I believe to be no exaggeration.

The following table shows the number of patients who passed through the hospital, each month, in the course of the five months during which it has been open, with the comparative mortality in each.

	Total, during Month.	Died.	Cured.	Proportion of Deaths to Recoveries.
February,	40	33	7	$4\frac{3}{4}$ to 1
March,	97	69	28	$2\frac{1}{2}$ — 1
April,	122	81	41	2 — 1
May,	56	40	16	$2\frac{1}{2}$ — 1
June,	126	94	32	3 — 1
Total and Average,	441	317	124	$2\frac{1}{2}$ — 1

This table exhibits a vast proportional mortality in February, owing, in part, to the disease being most virulent at its commencement, but principally to the patients' refusing to go to Hospital or even receive medical aid, until they found themselves dying.

The most alarming part of the above numerical statements is the vast mortality which they exhibit, and some may express surprise, that I have ventured to make public results so unfavourable. My aim, however, has been to ascertain facts regarding this disease, and as I cannot accuse myself of having neglected the patients committed to my care, nor of having failed to avail myself of any suggestions which have

appeared publicly, or been made to me in private, I have no good motive for concealment, and hesitate not to state the true results of my experience. At the same time, it must be allowed that many circumstances have combined to increase the mortality in the Albion Street Hospital, and thereby to give an unfavourable view of the destructiveness of cholera. The principal of these has been the prejudice which existed against the hospital—a prejudice which owed its birth to ignorance, and was fostered by terror, aided by misrepresentation and falsehood. The consequence has been, that the hospital has been too often looked on as a half-way house to the grave, fit for the reception of the most malignant cases only, and not even for them, until death had indelibly marked them as his own. Many of our cases were laid dead on our beds, others were brought in to blight with their expiring breath the usefulness of the hospital, and many, very many, although they survived a few hours, yet, at the time of admission, were so utterly hopeless, as to set all human means at defiance. Under such disadvantages, I am more inclined to ask myself how any recovered, than to express astonishment, because upwards of two-thirds have died. Who but one who has experienced it, can know the harrowing nature of that duty, whose hourly calls were the agonies of those whom it could not relieve, or the withering disappointment which followed the utter failure of remedies, which either hope suggested, or which were vaunted to have succeeded in other hands?

1st. Proofs of Contagion. The only building, of which the magistrates on the near approach of the pestilence, could at first avail themselves for conversion to a cholera hospital, is the house in South Albion Street, formerly occupied as a Police Office. Its locality is good in many respects. Being in the immediate neighbourhood of the present Police buildings and the Bazar, no filth was allowed to accumulate in its vicinity—the part of the town in which it stands is almost uniformly healthy—it is well aired, looking into the Bazar toward the west, to the present Police buildings toward the south, having a small back court to the north, and not being in immediate contact with any building to the east. Its distance from the river is also considerable. It underwent very ample repairs, and fires had been burning in every apartment of the house for weeks before a single patient was admitted. There is nothing in the building or its vicinity which can be pointed out as a “cholera locality.” From 12th February, to 20th May, 1832, we had in the house eighteen women employed as nurses, cooks, and laun-

dressess, the greatest number in the house, at one time, having been eight; of these eighteen, seven were taken ill in hospital, and reported as cholera cases, three recovered, and four died, consequently, $\frac{7}{18}$ of our nurses were seized, and $\frac{4}{18}$, or nearly $22\frac{1}{4}$ per cent. died. The following abstract of the fatal cases is taken from the hospital register:—

Mrs. Fulton, æt. 54, employed as nurse, 14th February, taken ill 16th, 3 o'clock, P.M.—died 9, P.M., 16th.

Widow Bell, æt. 34, employed as nurse, 18th February, taken ill 22d, 7, A.M.—died 23d, 2 o'clock, A.M.

Jane Stewart, æt. 25, employed as nurse, 22d February, taken ill 3d March, 1 o'clock, P.M.—died $5\frac{1}{2}$, P.M., 7th.

Mrs. Bell, æt. 35, employed 18th February, taken ill 30th March, $8\frac{1}{2}$ o'clock, A.M.—died $8\frac{1}{2}$, P.M.*

I have heard some ingenious reasoning employed by my non-contagious medical friends, to show that the above facts prove nothing. Their arguments amount nearly to this, "You cannot demonstrate the existence of contagious emanations, and you have no right to infer it—your nurses might have taken the disease from other sources, why say they caught it from communication with the sick?" The first of these objections applies to every disease which is not communicable by matter recognizable by our senses. To this class belong scarlet fever and measles, but who doubts that they are communicable? The second objection must be answered by applying to the case under consideration the rules which influence us in ordinary cases of evidence. Now, these nurses may be supposed to have caught the disease from the following sources. 1st. Cholera may have been endemic in the hospital, the house being what is called a cholera locality. To this I reply, it possibly may have been so, but there is neither in the house itself nor its vicinity, any appreciable cause; moreover, no case of cholera occurred in any of the streets near the hospital, nor had we any sent to us from the Police Office, only five yards distant, whose low damp apartments are nightly crowded with the victims of poverty, misery, and vice.† 2d. The nurses may have had the exciting cause of the disease latent in their system previous to admission.

* From May 20th to 1st July, no true case of cholera has occurred among our nurses or porters.

† The room used as the temporary abode of the dead is immediately opposite the windows of the Police cells, and standing, as I frequently did at midnight, in the centre of the narrow lane which separated them, I could not help contrasting the loud laugh and obscene song of the latter, with the stillness—the stillness of death—of the former. There was often too good reason for believing, that the inmates of the cell of vice on my right, and of the depository of death on my left, had been a few short hours before, boon companions.

This is possible in Mrs. Fulton's and Widow Bell's cases, the first having been only two days, and the second four days in hospital, previous to their illness. Jane Stewart was ten days, Mrs. Bell forty-one days in the house. But even in regard to Mrs. Fulton and Mrs. Bell, we must remark, that cholera often shows itself within twenty-four hours after exposure to its exciting cause, and that the one had been forty-eight, the other ninety-six hours in hospital before they were seized, and farther, that, after strict inquiry, I could not ascertain that they had lived in a cholera district previous to their admission as nurses. 3d. The women may have caught the disease by visiting infected districts while they were living in the hospital. It is quite possible, nay probable, that they did visit such places, but not likely that they remained so long in them as to imbibe their poisoned atmosphere.

Let us compare on this point the history of our Infirmary and Fever Hospital, during the same period. The Infirmary, on an average, gives employment to forty nurses, and, since the beginning of February, at least ten new ones have been taken into the house. They belong to the same class of society, have their families residing in the same parts of the town, are of the same habits and age with those employed in the Cholera Hospital; no restriction was imposed on them, either as to visiting their families in the town, or admitting their relations into the wards of the Infirmary, and yet not a single case of cholera has occurred amongst them, nor, I believe, in the Hospital.

In the Mile-End Fever Hospital, opened about six months ago, there have been employed, on an average, twelve nurses, and, since the beginning of February, sixteen have been admitted to supply vacancies. These nurses are taken from the same class of the community, as those employed in the Infirmary and Cholera Hospitals, and have not been restricted in any way in visiting their relatives during the prevalence of cholera in this city: not one of these has had cholera, but nine have had fever. There have been resident in the hospital, a clerk and an apothecary, and four young men have acted as substitutes for the clerk during his illness or absence; of the five young men occupied in visiting the patients, four have had fever; the one who escaped had only acted as clerk four days.

The evidence on this subject amounts to this.—In the Infirmary, the receptacle of surgical and chronic disease, one or two nurses have suffered from fever—in the Fever Hospital nine nurses and four clerks have had fever—in the Cholera Hospital seven nurses have had cholera, and several of the gentlemen connected with the house, premonitory symptoms,

but none the acute disease. Can we avoid the conclusion, that typhus fever and cholera are both contagious, the former to a greater degree than the latter?

While speaking of the Mile-End Fever House, I may be allowed to add, that four patients convalescing from fever were seized with symptoms of cholera, and died.

The history of our Hospital affords another proof of contagion. Patients were sent to us, or came of their own accord, not affected with Cholera, but who, after being sufficiently exposed to the Hospital atmosphere, took the disease. The following are examples:—

Case 1st. C.—W., æt. 29.—Admitted at 9 A.M., 16th April, with violent pain in left hypochondrium, but no symptom of Cholera. At five o'clock she had a severe epileptic paroxysm, to which she was subject, and on recovering from it, the previous severe suffering had disappeared. At seven o'clock she was removed to the convalescent ward, after having lain in the next bed to acute cholera cases for 10 hours. She continued quite well till 4 P.M. of the 18th, fifty-five hours after admission into Hospital, when she was attacked with all the symptoms of a severe form of cholera. At half past eleven the same night, the report, as copied from the journal, states that “the vomiting and purging had been profuse and characteristic. Pulse barely perceptible at wrist, in carotids feeble—surface cold—eyes sunk—countenance changed—restless.” This woman passed through a severe form of the disease and left the Hospital on the 29th convalescing.

Case 2d. Mrs. P.—, æt. 39.—Was re-admitted into Hospital, 10th April, 5 A.M., having been dismissed cured the day previous. She complained of severe pain of abdomen increased on pressure, and her pulse, skin, stools, and other symptoms indicated slight peritonitis. She was bled, fomented, and took calomel and opium. Next day her gums were affected and she was removed to the convalescent ward. On the 13th, at half past three P.M., about 58 hours from the time of her re-admission, she was seized with all the symptoms of violent cholera, and died at four of the morning of the 16th. I have no hesitation in saying, that neither of these women had cholera when they entered the Hospital.

Case 3d. A. B., æt. 31.—Admitted 19th April, mid-day. “Skin natural—pulse 90, weak—face characteristic—tongue slightly furred, moist, warm.” At ten P.M., the report states, “Pulse and temperature natural, tongue whitish—headach—no discharges.” She remained in the hospital till the 23d without a symptom of cholera, and I ordered her to be dis-

missed. She did not leave the house that day, but remained in Hospital all night, and rose at six next morning and dressed to return home; when she was about to take leave of the nurse, symptoms of the true disease suddenly seized her, and she died in seventeen hours. She had eaten oranges the evening before her last illness. If this were at first a case of cholera (which is very doubtful), she was certainly in perfect health on the 23d—whence came the exciting cause of the fatal attack?

The above detail of facts is sufficient, I think, to convince those who are accustomed to estimate the value of plain evidence on ordinary occasions, that cholera is to a certain extent communicable. I wish no more than their true value to be set upon the facts, "*Valeant quantum valent*," and I admit that there are other sources from which all of the nurses and patients *might possibly* have taken the disease; but would such a *possibility* be admitted in reasoning on any other subject? I know that the stern anti-contagionists will unhesitatingly answer "Yes!!" but I do not write in the hope of convincing *them*.

Predisposition.—We may obtain information regarding the predisposing causes of any disease from the following sources. 1st. By ascertaining the rank of life, occupation, and habits, of those affected by it. 2d. By attention to the general health, of those affected, previous to the attack; and, 3dly. By accurate examination of the body after death.

From the first of these sources, Hospital practice does not enable us to draw valuable information. From the second, a want of previous acquaintance with the patients brought into Hospitals, does not admit of very accurate conclusions. To the third source, we paid considerable attention, and our experience has furnished the following facts:—

Persons die of cholera, in none of whose organs the most accurate examination after death can discern any previously existing disease. The probable conclusion is, that such persons had been exposed to exciting causes, so strong, as to be irresistible even by healthy organs.

If we except the condition of the mucous membrane of the intestines, it may be said in general terms that the organs of those who die of cholera are peculiarly healthy. It was remarked by all who assisted at our autopsies, that they had never seen the same number of examinations exhibit as little disease. The brain, heart, liver, spleen, kidneys,* and urinary bladder, were almost universally found free from organic lesion. The lungs, disease of which constitutes so large

* The kidneys were more frequently diseased than any other gland.

a part of our annual bills of mortality, were found so generally healthy, that I could not have believed that the same number of individuals, taken indiscriminately, would have presented these organs in a condition so free from organic lesion. A few were found with old pleuritic adhesions; one or two with slight hepatization and some with incipient tubercles; but comparatively few with disease so far advanced as to produce general debility. From this I am justified in the inference that organic disease, or debility arising from this cause, does not predispose to cholera. This is a startling conclusion, but for its truth I refer to our Hospital Journals, which contain accurate histories of upwards of six hundred cases. How many hundreds are at this moment labouring under phthisis in Glasgow, and how few of them have been carried off by cholera!

If full muscular vigour, and plump, at times overloaded cellular and adipose tissue be any proof of adequate nutriment, deficient nourishment does not predispose to this disease. The majority of our patients exhibited apparently full muscular power, and few were much emaciated. A reference to the tables will show that out of 455 cases, 331 were between the ages of 7 and 50, while 30 were below 7, and 94 above 50. This conclusion is still more startling than the last, but must be admitted with greater limitation. We know that a very small quantity of vegetable food is sufficient to support life, and give the frame the appearance of muscular vigour and ample nourishment, yet when such persons are brought into competition with others fed on animal and more nourishing diet, their inferior capability of fatigue is soon manifested. It is probable that their relative power of resisting disease may be in the same ratio. Be this as it may, our experience falsifies the loose assertions of those authors, who assert that the diseased, the gaunt, and the emaciated, are the only victims of cholera.

A recent attack of fever does not seem to predispose to cholera. Typhus fever has prevailed extensively in Glasgow for many months past, the new cases in January, February, and March, being 150 per week. Very few of those who have recently had fever have been patients in the cholera hospital.

From the general healthiness of the organs examined after death, I excepted the mucous membrane of the stomach and bowels, and I did so because we frequently found so much disease in this texture and the mesenteric glands, as to induce all present to believe that some organic lesion had existed before the attack of cholera. In many instances, however, this membrane was perfectly healthy.

From the above facts I think myself entitled to draw the following conclusions:—

1st, Predisposition is by no means necessary to an attack of cholera. The man in the pride of health, surrounded by the comforts of life, and in the vigour of manhood, if exposed to a full dose of its exciting cause, may be struck down by its virulence; and the fact that such occurrences are rare, seems to prove that the predisposed are the victims of a less powerful poison.

2d, The rank of life and habits of our Hospital patients, would lead us to believe that deficient nourishment, irregular diet, and loose habits, place the system under the influence of a “small dose” of the cholera poison.

3d, Predisposition probably consists in disease of the mucous membrane of the stomach and bowels.

It becomes an interesting question what pathological condition constitutes predisposition, and in what part of the mucous membrane it is found. It appears to me to consist of the following stages or degrees of the same morbid state; the first degree does not amount to inflammation or change of structure, and is perhaps best expressed by saying that it is one much under the influence of irritating causes; the next stage is probably congestion, subacute inflammation, softening and increased volume of the membrane, and the last ulceration, and in some places considerable thickening. The nature of the inquiry renders it nearly impossible to reduce these opinions to certainty, but the amount of disease met with in the mucous membrane after death, and the great mortality among those cases, whose symptoms during life led us to suspect previous disease of these textures, adds great probability to the doctrine. I must not omit to add, that enlargement of the mesenteric glands was a very constant attendant on disease of the mucous membrane.

Proximate Cause.—In a report of this kind speculative opinions are inadmissible, but I think it fair to state a few facts which appear to me to bear on this part of the subject. Of all the patients admitted into Hospital there has not been one in whom the disease did not begin in the bowels and stomach. In the vast majority purging was either premonitory, or the first symptom. Some there were who said that nausea and vomiting first annoyed them, but all had purging early in the disease. In some there was no vomiting, in others no cramps, in a few the pulse, capillary circulation and respiration were good, but all, to a man, had a discharge of characteristic watery fluid from the bowels. So much am I convinced of this that I now consider watery purging essential to cholera, and have

no hesitation, in my own practice, in pronouncing any disease not cholera in which this symptom is absent. The purging is usually unattended by griping pains.

In every case, which I have had an opportunity of watching from its commencement, the failure of the pulse, capillary circulation and other symptoms of collapse, have been in marked proportion, to the amount of fluid discharged; the rapidity of its discharge, and its approach to water in colour, consistence and smell.

I know no symptom by which a common diarrhœa or disordered stomach and bowels can be distinguished from the early stage of cholera. I visited a young woman, at three in the morning, who had discharged the contents of her stomach and bowels, she said, in consequence of eating too much pork at supper. Her voice, pulse, skin, and respiration were natural, and she said she was as well as ever she was in her life. Who could have said this is cholera? To guard against accidents I gave an emetic followed by an opiate with brandy, and left her, she said, quite well. Three hours after, during which interval the discharges had continued, I found her voiceless and pulseless. Here the discharges are the primary disease, the asphyxia and cramps are secondary, and this my own experience would lead me to say, is universally true of cholera.

If the above be facts, what need is there to search for the proximate cause of cholera, in the ganglionic system, brain, heart, or lungs; the evidence of our senses points to the mucous membrane of the digestive system. I will not stop to inquire what part of this membrane is affected, but merely state that I believe that in this, as in every acute disease, the nerves of the injured organ sustain the first impression.

Are the following legitimate deductions from the facts stated? A morbid poison enters the system, impresses the nerves of the mucous membrane of the stomach and bowels, and forces the capillaries to discharge the serous portion of the blood and the salts which it holds in solution; the pulse fails because there is too little blood in the system; the lungs, because the thickened blood no longer finds its way into the capillaries of their air cells; the skin becomes cold because respiration and capillary circulation are imperfect; and secretion ceases because the glands have no longer the "materiel" on which to act. In a word, the serous discharges explain the whole subsequent train of symptoms, and the severity of the disease will, as I have already said, be in proportion to their amount, rapidity, and purity.

Stages, Symptoms, and Treatment.—My hospital experience

has confirmed me in the truth of the divisions which I made of the disease, into the premonitory, acute, collapsed, rallying, and re-acting stages.* I shall shortly state any facts of interest which the cases in hospital have brought to light, or illustrated :

Premonitory Stage.—Very few of our Hospital cases have been seen by me in this stage. Several of the persons connected with the hospital, have had repeated attacks of diarrhoea, but those nurses who died, either concealed the premonitory stage, or were seized at once with acute symptoms. In this stage, the grand indication, is to arrest the discharge by laudanum or solid opium, in a large dose. After some hours, if the secretions become morbid, a small dose of calomel and opium, followed by a very mild purgative, complete the cure. I think it is a great mistake to give even a mild purgative with the first opiate, or even to add calomel to it—the proper practice seems to be to allay the irritation in the first instance, and afterwards, if necessary, to improve the depraved secretions. Previous to the 1st of June, the greater number of our patients passed through the premonitory stage, but since that period, more especially while the disease was temporarily aggravated, premonition has been more rare, the acute being the first stage.

Acute Stage.—As I now consider the discharges to be the essence of cholera, the grand indication is to arrest them. Our chance of success will depend on the severity of the case, and the period at which we see it. A person, in whatever health, or circumstances, who has imbibed a full dose of the true choleric poison, and who is not seen until the pure watery discharges are established, is beyond the reach of any remedy yet discovered. A powerful constitution may save him, but his physician cannot cure him. At the same time, as we cannot say, when early called in, what case may prove moderate, and what quite unmanageable, our obvious duty is never to despair, nor abandon our patient.

If the case be not from the first inveterate, and be early seen, opiates repeated, as the symptoms demand, are frequently useful. I prefer laudanum to solid opium; if the dose be large, I give it without water, and if small, with no more than will allow the patient to swallow it. It is also most likely to do good, immediately after the patient has vomited, when there is reason to believe that the stomach is empty. If the stomach do not retain it, the rectum at times will. External heat to promote warm perspiration, frictions

and sinapisms, make up the treatment of this stage. The addition of an alkali to the laudanum is frequently useful in quieting the stomach. The only remarkable circumstance which has occurred in this stage in hospital, is that as the summer advanced, it has become shorter, and bilious vomiting been earlier established. In two of our cases, the vomiting was bilious throughout; the gall-ducts obviously having never ceased to transmit bile—both proved fatal. They were specimens of the true disease, proving, if indeed any such proof were now required, that the cause of the disease is not in the liver, and that the gall-ducts are not spasmodically closed. I may add on this subject, that I have examined personally, or Mr. Sisson (my very intelligent assistant), for me, nearly two hundred bodies, in not one of which were the gall-ducts impervious, and in the vast majority, bile was found in the stomach and duodenum.

Collapsed Stage.—The state of the pulse and capillary circulation, and the diminution of the discharges mark this stage. The nearer the disease approaches this period, the more dangerous does opium become; and when it is fairly established, this drug is decidedly detrimental. Opium is only useful in checking the discharges or alleviating cramps, and can do no good when these have ceased. I have frequently been astonished at the small quantity of opium which, at times, overpowers the nervous system in this stage at the very moment when all the energies of that system are required to keep up the little which remains of a feeble circulation. In collapse, after the primary discharges have ceased, I never give opium alone; I have also laid aside the lancet, and emetics of all kinds, and trust to external heat, frictions, sinapisms and internal stimuli. The last I often give with no sparing hand, and the moment the stomach will bear it, allow drinks *ad libitum*.

Rallying Stage.—The symptoms which most unequivocally indicate this period of the disease, are a restoration of the capillary circulation, increased heat or dryness of the tongue, and a change in the appearance of the stools. Much as has been said of the appearance of the discharges in cholera, I am not sure that any strictly accurate description of them has been given, and perhaps the following short notice may be pardoned. The first effect of cholera on the bowels and stomach is to evacuate the contents of these viscera, the second, to pour out a quantity of fluid into the canal, which carries with it what may remain of feculent matter. The bowels being washed clean, so to speak, by the watery fluid, at this stage of a severe case, the discharges will be found devoid of smell, colour, or any solid particle, even of mucus. If they retain

a feculent smell they cannot have been very profuse, and if they contain mucus, they are discharged so slowly as to allow secretion to go on. As they decrease in quantity and diminish in rapidity, the mucus accumulates and flocculi are seen more or less abundant. Here the truly choleric character of the stools ceases, and I have, in consequence, been in the habit of styling them primary. As the quantity of mucus increases, the stools assume a milky gruel-like appearance; this I have called the secondary stool; it is usually the first and most unequivocal symptom that the acute stage has passed, and that rallying has commenced. At this stage the mucous membrane is coated with tenacious mucus, and in almost every instance is increased in vascularity, its intensity depending on circumstances hereafter to be explained. At the close of this period the stools become slate-coloured or reddish, consisting of the matters last described, tinged with bile, and probably a little blood: at times they are red manifestly owing their colour to blood. Lastly, the bile increases and the stools consist either principally of this secretion or are feculent. Much as has been said of the absence of bile, and the proximate cause of cholera being in the liver, it is now fully established that of all the glands in the body the liver is the first to resume its functions.

The matter vomited follows nearly the same stages with that discharged by stool. When the stools exhibit a bilious tinge the vomiting either ceases or becomes deeply green. The rallying stage may now be said to have ceased and reaction commenced. During the rallying, unless some obvious symptom demand it, stimulants are omitted, and, to hasten the return of the liver and bowels to a healthy action, from fifteen to thirty grains of calomel with pulvis antimonialis, or small doses of pulvis doveri are given in divided doses.

*Reaction or secondary fever.**—Hospital practice has enabled me to accumulate facts on this subject, of which I was previously ignorant. I am inclined to divide it into several parts according to the organ affected and the most prominent symptoms. Some there are who recover from severe attacks without exhibiting any unpleasant symptoms. In these the tongue and skin become warm, bile is secreted in moderate quantity, the pulse returns to the wrist, the urine flows freely, and convalescence is rapidly confirmed. These, however, are the fortunate few, and probably do not form a twelfth part of true

* Secondary fever was much more common, in some parts of India, than was at first believed. Mr. Jamieson in his Bengal report was evidently acquainted with many of its forms, and found it very common in the lower provinces of Bengal.

cholera cases. Our hospital experience would prove that about a fifth of those who die of cholera are carried off by hæmorrhage from the intestines, and secondary fever; and at least a half of those who recover from severe attacks, pass through a train of secondary symptoms before their convalescence is secured.

I would arrange the secondary symptoms as follows. 1st. Bloody stools. 2d. Profuse bilious vomiting. 3d. Affections of the mucous membrane of the ilium, colon, and rectum. 4th. Congestion and inflammation of the lungs. 5th. Subacute inflammation of the arachnoid and pia mater. 6th. Suspension of the secretion of urine. Of each of these I shall say a few words.

1st. *Hæmorrhage from the bowels*, or, as they are styled in our Hospital Journals, "*bloody stools*." Of this form of termination we have met with upwards of forty examples. They may be divided into those which occur before the pulse returns to the wrists, and those which appear after secondary fever, has been established. They almost universally appear in patients beyond the age of forty, and are so common in those upwards of fifty, as to be the cause of death in almost all of that age who escape the acute stage. They appear under three circumstances. 1st. In many cases the secondary stools are early tinged with florid blood, without any precursory symptoms, the quantity gradually increases, becomes dark coloured, putrid, and exceedingly offensive. 2d. Violent irritation and restlessness, with manifest symptoms of congestion of some other organ precede the discharge, and are materially relieved by its appearance. 3d. Some patients complain of pain across the abdomen, usually its upper regions, at times excruciating, which is followed and relieved by the discharge of blood by stool. In whatever manner the stools are ushered in, the progress and termination of the cases are very uniform. At first the patient does not suffer, or appears relieved; soon, however, his hands, arms, face, and head, become cold and livid, he is uneasy, gradually gets more and more restless, until his sufferings, from this cause, seem beyond endurance, he tosses from side to side in bed, has a constant desire to leave it, and frequently dies in one of his abortive attempts to do so. The purging usually ceases before death, the pulse is gone; almost all are delirious, a few furious. Bloody stools are almost a mortal symptom. If the patient be old, and the discharge profuse, his fate is sealed; if young, and the purging moderate, he may survive—but even under the most favourable circumstances, few escape. The cause of this symptom seems to be a discharge of blood

from the same capillaries which poured out the primary watery stools. The serous portion of the blood being drained off, the vessels which yielded it, become gorged to over-distention with red blood, which soon finds its way through them, and is discharged by stool. This symptom (in my experience) is never seen in children, their mucous membrane and capillaries being powerful, bear purging well: for the opposite reasons it is exceedingly common in old persons. In middle aged, robust people, it either appears as a relief to congestion of some other organ, or is preceded by violent pain, the latter probably caused by the passage of blood through a previously strong membrane.

Bloody stools sometimes appear in patients labouring under congestion of some distant organ, in general the lungs. Several of our patients, distressed with violent dyspnoea and extreme restlessness, have been so suddenly relieved by a discharge of blood from the rectum, as to induce us to conclude, that in them it was temporarily beneficial. Their termination, however, was fatal, the disease passing through the stages above described.

The discharge of blood is sometimes preceded by violent pain across the upper part of the abdomen. Dissection shows, that the discharge is usually yielded by the lower portion of the ilium, caecum, upper part of colon, and lower portion of rectum. In a few, the jejunum was the intestine affected, all below being sound. In these last, the discharge was preceded by violent abdominal pains.

The appearances on dissection vary from slight redness, with effusion of a little blood mixed with mucus on the inner surface of the intestine, to the deepest injection of the mucous membrane, ecchymosis, injection and thickening of the sub-mucous cellular tissue, elevation of the membrane into irregular, pile-like excrescences, softening, roughening, abrasion, and lastly, partial sphacelus of the membrane itself.

I need hardly add that I know not how to cure this affection. I have tried leeches, blood-letting, blisters, warm bath, stimulants, in a word, every thing that empiricism could suggest, without avail. The standard prescription in the Hospital is an emulsion of turpentine, given in doses of from thirty to sixty drops of the turpentine, every hour or second hour. This mixture, with whisky in such doses as the head will bear, has been more useful than any plan of treatment we have tried.

Bloody stools more rarely appear in the secondary fever, and are then usually preceded by profuse bilious purging. Although always a most unpleasant symptom, they are much

less dangerous at this than an earlier period, and are frequently under the control of the turpentine emulsion, the warm bath, and sinapisms to the abdomen. My intelligent assistant, Mr. Sisson, is of opinion, that, in the secondary cases, the blood is yielded by the large intestines. Be this as it may, when we examine the intestines of those who have died, a few days after the discharge has ceased, the mucous membrane is found less generally injected, the irregular pile-like excrescences already alluded to, are found to have subsided, and the membrane which covered them, rough, and of a greenish-yellow colour. It is probable that this appearance is a stage of sphacelation, and if the patient had survived, the portion so affected would have separated, and left an ulcer.* These appearances are most commonly met with in the cæcum and rectum.

2d. *Profuse bilious discharges, principally vomiting.* After the secretion of the liver has been restored, bile continues to be discharged from the stomach in immense quantities, the stools are not numerous, and yellow; the pulse returns, but reaction is never fairly established, the skin never becoming hot, and the tongue being cold, moist, and yellow, or green. No urine is secreted, and distressing hiccup is at times the cause of great irritation. If the case be about to terminate fatally, the vomiting continues, and stupor, coma, and sinking, are the precursors of death. If recovery be to take place, the sufferer usually lapses into some of the forms about to be described, bilious vomiting, more or less profuse being almost universally the first stage of severe secondary affections. The colour of the matter vomited is peculiar, varying from yellow, which it is at first, to the deepest sea-green; at times it is so intense, as at first sight to have the appearance of indigo dissolved in water. When the vomiting is the apparent cause of death, the gall-bladder is found full of bile, the stomach, duodenum, jejunum and upper part of ilium coated with very tenacious mucus, deeply embued with bile and the lower half of the mucous membrane of ilium deeply injected and ecchymosed. The treatment which I have found best adapted for this secondary affection, consists of emetics followed by stimulants and counter-irritation. Half an ounce of salt, or a scruple of ipecacuanha repeated, as the quantity of bile discharged demands, with a sinapism over the upper part of the abdomen, and whisky internally, when the stomach will retain it, constitutes the principal part of

* Since writing the above I have met with a case in which separation had taken place, leaving ulcers with well defined margins.

the treatment. The emetic seems to act by mechanically emptying the gall-bladder, and ridding the stomach of a constant cause of irritation. I prefer sinapisms to blisters, because with us vesication of the surface has produced great irritation, and been very difficult to heal, probably in part owing to the incessant tossing of the patients.

3d. *Affection of the mucous membrane of the ilium, colon, and rectum.* 4th. *Congestion and inflammation of the lungs.* 5th. *Sub-acute inflammation of arachnoid and pia mater ending in typhoid symptoms.* I class these three affections together, because the symptoms which precede their development are very often alike—because they are frequently found combined in the same individual—and because they all terminate in typhoid delirium and depression. Their progress is this. A patient recovers from a severe collapse, at times rapidly, at others more slowly, after copious, deep green vomiting. During the third day of his disease, he says he is quite well, is in good spirits, and all symptoms appear favourable. In a very few hours he is observed to sleep longer and more soundly than natural, but when awake he is rational, and his sensations are so pleasurable, as evidently to indicate a peculiar cerebral affection or sympathy. A Scotch patient, when asked how he is at this stage, replies, “I am fine.” I never met with a recovery after this answer, given in the above circumstances. There is no urine; the bowels are slow, or the discharges bilious; the temperature and pulse good. The impetus of the heart, almost uniformly of the right side, becomes augmented. In some this symptom is only discernible by the stethoscope, in others it is so powerful that the action of the heart and the larger vessels is distinctly seen, the pulsation being at times so great as visibly to shake the upper part of the body. The stupor and profound sleep go on increasing. The breathing is deep, and snoring, and even if disease be not subsequently developed in the lungs, the respiration is sonorous and bronchial. The subsequent symptoms are modified by the organ chiefly affected.

1st. *If the principal seat of the disease be the intestinal mucous membrane,* the patient soon becomes restless, tosses incessantly from side to side, his belly is painful on pressure, he has hiccup, seems to suffer excessive agony from an unbearable general irritation, his pulse flags, his skin is below the natural temperature, his tongue dry, crusted, and cold, he has no stools, the vomiting continues bilious, no urine is secreted, and he sinks rapidly. Dissection discovers the mucous membrane in one or other of the states already described, but most frequently in that in which the disease is

seated in the large intestines, exhibiting the ecchymosed pile-like patches, in a state approaching to sloughing and ulceration. Some cases are more prolonged, the symptoms are more acute, the pulse full and hard, and indicative of inflammatory action. The blood drawn is deeply buffed and cupped. The patient dies, and dissection discovers no appearances besides those stated.

I know of no certain cure for the above affection, but leeches to the lower belly or anus, the warm bath, sinapisms, and small doses of turpentine, are more useful than others which we have tried.

2d. *The Lungs.* When the lungs are the organs chiefly affected, the symptoms having proceeded to the stage already described, as common to this class of secondary affections, the respiration becomes gradually more imperfect. At first the precussion is good and the stethoscope usually discovers the murmur, brônchical and sonorous anteriorly, and silibous posteriorly, especially on the right side. There is something peculiar in the respiration at this stage, to which I confess my knowledge of the stethoscope does not enable me to give a name. By degrees the murmur becomes more and more indistinct, till at last nothing is heard but the mucous râle in the larger air tubes. I have rarely discovered the *râle crepitant* well marked, a circumstance for which I find it difficult to account. The patient never complains of pain in his chest, and becomes exceedingly restless, throws himself out of bed, and dies exhibiting typhoid symptoms in their most rapid and aggravated form. Dissection discovers the bronchial tubes filled with frothy mucus, and their mucous membrane highly injected. The lungs themselves, according to the duration of the case, are found in one of the stages between posterior engorgement and complete hepatization, at times with pure pus in the smaller bronchial tubes; this last is comparatively rare. The lungs vary remarkably in cases of cholera. In death, from collapse, they are frequently exsanguine, without the usual posterior ingorgement, and weigh from eighteen to thirty ounces. In examples of secondary affection, I have found them engorged, hepatized, and weighing 65 ounces, one right lung weighed 39 ounces.

We may at times avert or ward off this sequela of cholera, but if it gain a footing, treatment is unavailing. After twenty or thirty grains of calomel in divided dozes, I am much inclined to put the patient into the warm bath and bleed him from the foot; if he be improved and stand the loss of blood, I repeat the bleeding, if not, he is put on wine and stimulants. I have cupped and blistered very freely, with very

little benefit. I think I have checked this terrible malady by the means mentioned, but I have never cured it after it was fairly established. We have occasionally met with more acute examples of chest affection, the following is the best marked.

Case 432. I. B. æt. 32.—Robust, admitted June 25, 1832, 8 A.M.

The symptoms on admission were well marked, the respiration hurried and the pulse barely perceptible at wrist. The purging had been profuse during four days, and the cramps and vomiting were of twenty-four hours' duration.

Descendat in Balneum tepid

R. Pulver. Dover.

Calomel utr. gr. x. m. St. Sumend.

At ten P.M. of the 26th, there being no urine, ℥j of tepid water was injected into the bladder. On the 27th, at ten A.M., he complained of pain in the hypogastrium with inclination to pass urine. The catheter was introduced, and no urine being obtained, an injection containing tepid water ℥j laudanum 3 ss. was thrown into the bladder,* which he retained till eight in the evening, when 3 vj of bloody fluid, having a urinous smell, was evacuated, succeeded by a severe rigour.

28th, 10 A.M. Action of heart, and respiration, were reported natural, but the irritation of the bladder continuing, he had the warm bath, twenty leeches to perineum and pubis with gr. xv Dover's powder. On the morning of the 29th, I found him labouring under acute pneumonia, marked by severe dyspnœa and the usual stethoscopic signs. The tongue and uvula were dry, hard, and contracted, and the mucous membrane of the mouth, fauces, and nose more parched than I have ever seen them in any disease, or under any circumstances. The intonations of his voice were nasal, the cough slight without expectoration. I bled him from a large orifice to 3 xl. applied a sinapism to his chest, and ordered him a solution of tartar emetic. The venesection to be repeated, or cupping glasses applied as the symptoms might demand. During the night he was cupped over the chest with almost immediate relief, but the pulse failed, the mucous râle became loud, and he died at 4 P.M., 30th June.

Inspection 21 hours after death.—Weight of lungs, 3 lvii, right 3 j heavier than left. Greater part of substance of both lungs engorged, approaching in many points to hepatization and of a deep purple colour. A few of the air cells at several points on posterior part of right lung seemingly ruptured, and forming small hydatid-like prominencies filled with air. Bronchial tubes filled throughout with white frothy mucus, their lining membrane, deeply injected. Bladder contained two ounces of very turbid urine, its mucous membrane over fundus and neck injected. Other organs and tissues healthy.

3d. *Head affection.* The symptoms here, in many respects,

* Injections into the bladder, especially opiates, are favourite remedies in the Albion Street Hospital.

very closely resemble common typhus. We have the typhoid expression, muttering delirium, and injected eye, with cerebral symptoms seemingly proportioned to the amount of disease in the head. It is easily distinguishable from the affections already described, by the absence of the pain in the abdomen, and of the stethoscopic indications, with less restlessness; and from typhus fever by the coldness of the tongue, the quantity of bile in the stools, and the absence of urine. In the last days of these three forms of secondary affection, the catheter finds urine in the bladder in considerable quantity, but the secretion is more deficient than in typhus.

In some cases we meet with acute delirium at times closely resembling delirium tremens, the prominent symptoms of which last have always been deep suspicion, and a dread of being murdered. More than one did their utmost to alarm the neighbourhood. In other cases again, the stupor and profound sleep previously alluded to have gone on increasing, the patient becoming almost as insensible to external stimuli as in cases of compressed brain.

On dissection in some of these cases, the vessels of the dura mater, both the trunks and ramifications were found turgid; the brain moist with fluid, in very minute quantity between the folds of the arachnoid, in greater quantity, between that membrane and the pia mater, under the pia mater, in the ventricles, at the base of the brain, and in the spinal canal. The brain generally very firm. The mucous membrane of the small bowels was occasionally so much affected, especially in the very typhoid cases, as to induce me to consider it the seat of the disease. The glands of Peyer and Bruner were also found in great numbers and very large, but their appearance has been so little uniform in any stage of cholera, as to induce us to think that disease in them is accidental, not necessary. In a few cases *post mortem* examination threw no light on the cause of the symptoms, the brain being very firm, and every other organ and tissue perfectly healthy.

Wine in full doses, opiates, or leeches, and cold applications to the head, with calomel, according to the form assumed, constitute the principal part of the treatment. I have never seen counter-irritation useful. We ought never to forget, that, in this, and in all the forms of secondary fever, we may, by early treatment, arrest the progress of the symptoms, but cannot cure the formed disease. I know of no prophylactics so powerful as the warm bath, bleeding, and seidlitz powders, proportioned to the patients' strength.

6th. *Suppression of urine.* The state of the secretion of urine in the different stages of cholera is remarkable. Its absence during the early stages is sufficiently well known. If convalescence be rapid, even after a severe attack, the urine is secreted early, first in small quantity and turbid, and next abundantly and limpid. I have never seen relapse, severe secondary symptoms, nor death, when limpid urine had been discharged copiously, before coma had shown itself. This coincidence is too uniform to be accidental, and is probably one cause of recovery. It also forms an excellent test of certain convalescence. During the early stages of the secondary affections already sketched, the kidneys continue inactive, and, if the patient be rapidly carried off, they continue so till death. If, however, he survive until the typhoid symptoms are fully developed, the suppression ceases, but retention in most cases continues. At this period the catheter generally finds urine in the bladder, at times limpid, and in considerable quantity. I have never, however, seen it as abundant as in health. I was at one time inclined to consider the absence of urine, as the cause of the secondary symptoms, and gave diuretics of all kinds very freely. Subsequent experience, however, has induced me to reject the theory, and lay aside the practice.

Although in the majority of instances suppression of urine must be regarded as an effect, not a cause, yet I have seen cases in which the kidneys remained so obstinate after all other secretions were restored, that I cannot help concluding, that on whatever their inertness may depend, it must be looked on as the immediate cause of the subsequent train of mortal symptoms. The cases alluded to have been all old persons, who, having passed through a severe form of cholera continued convalescing for some days, until their progress seemed checked by the obstinacy of the kidneys. Sleepiness, stupor, coma, floccitatio, coldness of the surface and typhoid delirium appeared in regular succession, and put a period to the patients' sufferings. The following is an example:—

Case 420. J. G., æt. 50. Admitted, June 23d, 6 P.M. Robust for his years, and previous health good.

On admission his symptoms were well marked, but the pulse being 90, and, continuing of moderate strength, he was bled, had the warm bath, and calomel, with Dover's powder. On the 24th, his respiration was 24, his sensations comfortable. 25th, Stools bilious, tongue cleaner, pulse rather feebler. He had no bad symptoms except absence of urine. At this period, any one unaccustomed to see cholera cases, would have pronounced him free from danger. During the evening of the 25th, he began to sleep more than natural, which by slow degrees ended in complete stupor, floccitatio, and low muttering delirium. Not a drop of urine was discharged, and the catheter introduced 24

hours before his death, found only two ounces of turbid urine. He died on the 1st July at half-past two, A.M.

Inspection 34 hours after death. *Head.*—Dura mater much injected, and sinuses engorged. The trunks and minuter branches of vessels of pia mater highly injected. Copious serous effusion between and under arachnoid and pia mater, the latter membrane very easily detached from convolutions of brain. General effusion into cavities of brain, but organ itself so soft as to prevent minute examination. *Chest.*—Pericardium contained 3 ij of serum. Lungs weighed 3 xlv, and were throughout infiltrated with serum, particularly on right side. *Abdomen.*—Kidneys healthy, containing ordinary quantity of blood. Deep purple injection of lower portion of mucous membrane of ilium. Other organs healthy.

Although I have thus endeavoured to arrange the secondary affections in cholera, according to the organ principally implicated, yet, in very many cases, two or even all of the classes of symptoms separately detailed are met with. It would be strange, indeed, were it otherwise. They have most probably all a common cause modified by individual circumstances. It becomes a highly interesting question what is this cause, and how happens it, that a peculiar fever, remarkably uniform in many of its characters, follows every case of severe collapse? The effects left by the primary disease seem to become the causes of the secondary symptoms. These effects appear to me, as already stated, to be injury, inflicted on the mucous membrane by the passage of the serous discharges through its vessels, and deterioration of the blood thus deprived of some of its essential constituent parts. That several of the secondary symptoms depend on the first of these causes I have already attempted to prove. The sympathy which exists between the intestinal mucous membrane, and the head and chest has been long known to the profession. That the deteriorated condition of the blood is a cause of many of the symptoms I infer from the circumstance already stated, that in some of our fatal secondary cases no lesion of the solids was discovered after the most minute examination; leading me to conclude, that the liver discharges enormous quantities of bile, because the ingredients which go to form it, are in excess in the blood, that the kidneys are inert, because the fluid and saline portions are deficient, and that coma and muttering delirium follow, because the brain is implicated by sympathy, or not supplied with its healthy stimulus. Elderly persons, or younger individuals who have suffered severely from collapse, seldom recover, because the intestinal mucous membrane is not in a condition to supply by absorption, the ingredients deficient in the blood, whereas children, for the opposite reasons are almost certain to recover, if the pulse

return to the wrists. I have not seen a single instance of death in the Albion Street Hospital from secondary head or chest affection in a child.

This report is already too long, and I will not try the reader's patience by a detail of my experience of individual remedies. Suffice it to say, that I have not been slow to put every rational proposal to the test of experience, and the result has been the utter failure of every measure which has come recommended as a specific. Practice in cholera to be successful, must be simple, and must accommodate itself to symptoms.

Saline injections, into the veins, are the most novel practice, which has been attempted since cholera appeared in Great Britain. The results of our experience on this most interesting subject I communicated to the Medical Gazette, a few weeks ago. I had then injected nearly thirty patients, four of whom recovered. Since that time, I have tried in ten cases, injection of distilled water, in quantities of from ten to twenty-four ounces, the patient being in the warm bath at the time of injection. Two cases rallied, but died in secondary fever, a third was powerfully stimulated by the injection, sat up in bed, and sang a hymn, but died delirious in a few hours. None recovered, and the practice of injecting, has since been laid aside, as useless, if not injurious. These last trials have confirmed the opinion I ventured to give in the Gazette, that the saline injections act as stimulants, not as specifics.

In concluding this report, I trust I may be allowed to say that the harassing and fatiguing duty of physician to a Cholera Hospital, has been lightened by the opportunity which it has afforded me of forming the valuable acquaintance of several strangers and foreigners who have done us the honour of visiting our Hospital. My friend, Dr. A. Buchanan will, I hope, excuse me for taking this public opportunity of most sincerely thanking him, for his numerous visits, for his most friendly assistance, and for the many valuable hints of practice with which he has favoured me. To him we owe the revival of the use of the warm bath, a practice highly beneficial in many cases of collapse and secondary fever.

It would be worse than injustice, if I omitted to say, that all the young men who have acted as clerks in the house, have acquitted themselves in the most praiseworthy manner. Mr. Sisson has been in the Hospital ever since it was opened for the reception of patients, and for zeal in his profession, industrious perseverance, and knowledge of the disease, I have seldom met his equal.

SECOND REPORT

OF THE

CHOLERA HOSPITAL, ALBION STREET, GLASGOW.

From the Glasgow Medical Journal of November, 1852.

FROM 1st July, the date at which the first report of the Albion Street Hospital was closed, to 1st October, 577 patients have been admitted, of whom 225 have recovered, and 352 have died, the recoveries being to the deaths as 1 to 1·564.

Of the admissions 217 were males, and 360 females; the males being to the females as 1 to 1·659.

Of the 217 males, 78 recovered, and 139 died, the recoveries being to the deaths as 1 to 1·782.

Of the 360 females, 147 recovered, and 213 died, the recoveries being to the deaths as 1 to 1·449.

The following table exhibits the number of seizures, and the results at different periods of life.

Ages.	Nos.	Proportion to whole.	Died.	Recov- ered.	Proportion of deaths to recoveries.
Under seven	13	1 to 44·4	7	6	1 to 0·856
From 7 to 20	43	1 to 13·42	19	24	1 to 1·26
20 to 30	129	1 to 4·47	59	70	1 to 1·18
30 to 40	106	1 to 5·44	56	50	1 to 0·892
40 to 50	130	1 to 4·43	84	46	1 to 0·548
50 to 60	58	1 to 9·96	44	14	1 to 0·318
60 & upwds.	98	1 to 5·77	85	13	1 to 0·153

The next table shows the number of patients who have passed through the Hospital during each month, and the comparative mortality.

	Total during month.	Recovered.	Died.	Proportion of recoveries to deaths.	MALES.		FEMALES.	
					Died.	Recovered.	Died.	Recovered.
July,	240	97	143	1 to 1.47	57	37	86	60
August,	273	97	176	1 to 1.81	64	29	112	68
Sept.,	64	31	33	1 to 1.06	18	12	15	19

Of the 352 deaths 219 died in collapse soon after admission; and 71 of discharge of blood by stool, the great majority without return of the pulse to the wrist; 62 died of secondary affections, of whom 14 died of bilious vomiting and purging, 9 of chest affections, 12 of head symptoms, 10 of typhoid fever, 9 of heart affections, and 8 of excessive irritation. In many of the secondary cases, two or more of the symptoms mentioned were combined—they have been classified, however, in accordance with the symptom which was most prominent, and which appeared to be the principal cause of death.

Of the 225 recoveries, 71 were severe cases, only five marked "pulseless," and 154 were mild. Deducting the mild cases from the whole number affected, and comparing the severe recoveries with the remainder, we have 71 to 423, or within a fraction of one to six—so that of the severe cases one-sixth recovered and five-sixths died; being rather an improvement since the last report. It would thus appear that the diminution of proportional mortality in the last three months, is owing rather to an increased number of mild cases, than to an improved medical treatment of the severe or advanced form of the disease. The increased number of mild cases may be owing in part to the panic, which the ravages of the disease in the last days of July occasioned, inducing patients to apply earlier for medical aid, and in part, we may hope, to an improved mode of treating the first stages of the disease. In making the above statement, in which I am not conscious of concealing any thing, it is only justice to all connected with the Hospital to say, that of the 423 severe cases, the great majority were admitted in a state of collapse, or closely approaching to it. Without throwing the slightest imputation on any man, I may say that I would be glad to see a *bona fide* numerical statement, somewhat on the plan of the above, given, not by those who boast of *curing* two-thirds,

or three-fourths of their cholera cases, but by those who say they can *cure* even one-half.

The above numerical statements and tables confirm almost all the conclusions which were drawn from those of last report, with the exception of the anomaly then noticed, of the disease having proved more fatal between the ages of thirty and forty, than forty and fifty. According to the first table, the constitution during the vigour of youth and early manhood, resists the disease with greater success than in infancy or advanced life, and in infancy more successfully than in old age.

Proofs of contagion.—No death has occurred among any of the hospital attendants since the date of last report, but one male and four females have had the disease. One of the earliest cases of this quarter's report is that of a male nurse, James M'Nair, who had a mild attack and recovered. From the 14th to the 19th of August, four of our nurses were taken ill, three of them very severely, one mildly. One passed through rather a severe secondary fever, but all recovered. It is worthy of remark, that, although at the time they were seized, the hospital was full, it was not so crowded, nor was the disease so virulent as it had been ten days previously. Many of the hospital attendants suffered from diarrhoea. Persons admitted intoxicated, or labouring under other diseases, have been seized with cholera under circumstances similar to those stated in last report. On the whole, the proofs of contagion have not been so strong in the present as in the former period.

My opinions as to the predisposing and proximate causes of cholera, more especially the latter, have been confirmed by extended experience.

A few practical improvements in the treatment of the different stages of the disease have suggested themselves, which I shall now proceed to state.

Premonitory and acute stages.—On opiates I continue to place my chief reliance in the premonitory and acute stages. In the last report, perhaps too little was said of the efficacy of opiate enemata. I have lately in repeated instances, found them of the greatest service. When called to an adult labouring under suspicious watery diarrhoea, I order him immediately to bed, load him with blankets, put warm bottles to his feet and spine, throw into the rectum from half a dram to a dram, or even a dram and a half of laudanum, and give by the mouth an opium pill. These are repeated according to the narcotism produced, their influence in restraining the discharges, and the quantity of the medicine retained. It very

frequently happens, that after the discharges have been profuse, the vomiting either ceases, or recurs at longer intervals more mildly, and there is no stated call to stool; the pulse, however, continues to flag, other symptoms are aggravated, and the medical attendant concludes, that the disease is running its course, independently of the discharges. Let him, however, examine the bed and the sphincter ani, and he will find the bedding drenched with serum, the sphincter relaxed, and liquid flowing from the intestine in a slow but continued stream. Under such circumstances, enemata are useless. I therefore rub up two or three grains of powdered opium, with a little lard, introduce it "in anum" on the point of the finger, and smear it over the mucous coat of the intestine. I then apply a pad over the anus, or plug it with a sponge, and retain the whole by a proper bandage. The opiate by the mouth is repeated. Experience tells me that the safety of the patient in cholera depends on the period at which he is seen, and the energy and skill with which opiates are administered, and heat applied. When I say this, I of course exclude these virulent cases, and unhappily they are numerous, over which, at no period, can medicine exert any beneficial influence.

What a melancholy picture of the value of medical evidence does the above statement, made after treating at least 1,200 cases, exhibit, when contrasted with declarations pouring from the London periodical press, that every patient who swallows an opiate dies! The pages of our hospital journals contain ample evidence that opium does not kill, and the averment that in this city, in many hundred cases, and in various forms, it has proved decidedly beneficial in the premonitory and acute stages, does not rest on my evidence alone—almost all our practitioners give opium, either alone, or combined with other medicines; in my own practice having found combinations either useless or injurious, I trust to opium and warmth. I beg distinctly to be understood as recommending opiates in the premonitory and acute stages only. As collapse approaches they must be given with caution, and where it has fairly supervened they must be entirely abandoned—the discharges have then nearly ceased—opium can hardly do good, and the risk of its doing harm is very great. As regards calomel, I would not exclude it or other mercurials from the treatment of many diarrhoeas; it is in the suspicious or acute serous discharge that its employment has appeared to me questionable. Again, when the stools which I described in last report as secondary, show themselves, calomel and ipecacuanha are frequently beneficial; opium, in combination, must be given very sparingly.

Symptoms which would serve as diagnostic of a diarrhoea, premonitory of cholera, are perhaps still a desideratum. The following, though not present in every case, I have found very common. The call to stool is sudden, not preceded or attended with griping, and the discharge is often from the first watery. In many instances the purging is even agreeable, and the whole sensations of the patient have something so peculiar, that many who had lived for months in a painful state of morbid terror, have become so apathetic when under the influence of the poison, as to neglect till too late medical assistance, or even to reject it when procured. The tongue is moist, even where the thirst is urgent; it is generally clean, and early becomes cold. The pulse is not excited, the surface cold, and often shrivelled—all or any of these symptoms give to a diarrhoea a very suspicious character.

Collapsed Stage. So much has been said of *curing* patients in collapse, especially by some recent writers in the London periodicals, that I feel it almost presumptuous in me to say that I deem a *cure* in the present state of our knowledge an impossibility. All that I propose to myself is not to do harm, and to assist, but not impede, the efforts of nature. The means which I still find most efficacious are to omit opiates the moment the purging ceases, or narcotism is threatened—to keep the patient moderately warm, to give stimuli in moderate doses, and mild drink, cold or warm, nearly *ad libitum*. As regards stimuli, our hospital mixture is one ounce whiskey, to two ounces water, coloured with spt. lavand. comp., of which an ounce is given alone, or in water, every hour, or every second or third hour, according to circumstances. These quantities are moderate, and I cannot agree with those gentlemen who think that they do harm. As to drinks, since the appearance of Dr. Chute's papers on this subject, I have given them more freely before the vomiting has ceased than formerly; with what effect I shall state when speaking of individual remedies. Cramps, spasms, and local affections, are treated with sinapisms made with laudanum, frictions, fomentations, and pediluvia. For the rest, I trust to nature and perfect quiet.

I am quite sure that the number of cases which ultimately recover after having been perfectly pulseless at the wrist, is smaller than is generally imagined, certainly greatly smaller than the number of vaunted remedies, which are daily issuing from the periodical press, would allow the inexperienced to believe. On reading over our hospital journals, I was forced

bly struck with the very small number of recoveries of pulseless cases which it exhibits. Many have recovered from collapse in whom the pulse was reported "flickering," "barely perceptible," "not countable," but very few in whom it was imperceptible. The ultimate recoveries from this state, probably do not exceed one or two per cent. of reported cases. In all collapsed cases, more especially those which are pulseless, we must bear in mind the distinction between a cure and a recovery. It is from overlooking this very obvious distinction, that so many medicines and plans of treatment have been given to the world as specifics. Repeatedly on leaving the hospital I have declared certain patients to be beyond all hope, or even possibility of recovery, and on returning a few hours after, I have found, to my astonishment, the pulse good, the skin warm, and all symptoms of collapse gone. I do sincerely believe that my unfavourable prognosis had as much to do with the recovery of these patients, as venous injections, saline powders, calomel, cold water, or any other specific, with the restoration to health of those which they are reported to have cured.

Bloody Stools. Of this formidable symptom we have had upwards of seventy examples. Of its pathology and treatment I can say nothing new. No medicine or plan of treatment that I have tried has had the slightest beneficial influence. All who have had this symptom well marked have died.

Secondary Fever. Since last report I think I have ascertained some additional secondary symptoms, which I am now inclined to class as distinct affections. I would arrange them as follows: 1, profuse bilious discharges, principally vomiting; 2, head affections and typhoid symptoms; 3, affections of the lungs; 4, affections of the heart; 5, of the intestinal mucous membrane; 6, excessive general irritation; 7, continued suppression of urine. Under each of these heads I shall state any thing new which I think I have ascertained since last report.

1. *Bilious Vomiting and Purging.*—This secondary affection has proved exceedingly troublesome; in several instances it has appeared to produce head affections, and in others it has destroyed the patient from continued excessive irritation and exhaustion. In addition to the morbid appearances formerly mentioned, I found in several cases, numerous ecchymosed patches on the stomach, and great vascularity in the duodenum, particularly around the aperture of the gall-duct. Emetics, as recommended in last report, have been found to fail in

obstinate cases; in such, I give a large purgative enema, followed by a seidlitz powder, and when the bowels have been cleared, an opiate enema, and small doses of calomel and opium. The vomiting continuing leeches are applied over the duodenum, and a bandage tightly bound round the upper regions of the abdomen. Of late I have found an opiate enema and small doses of calomel and opium, or the muriate of mercury and laudanum, very useful, without being preceded by either an emetic or purgative. I have also thought that copious draughts of cold water, or any mild liquid that the patient might ask for, diluted the bilious discharge, and thereby diminished the injury done to the mucous membrane.

Of two young girls, (cases 939 and 961,) who laboured under these discharges for several days, the one died with all the symptoms of acute meningitis, the other became maniacal and died comatose. The latter symptoms in both were probably caused by irritation and inanition.

2. *Head affection and typhoid symptoms.* On this subject I can add very little to what is contained in last report. I think we have had fewer cases approaching to *delirium tremens*, and a greater number beginning with sleepiness, and terminating rapidly in profound coma. I know not how to cure this unmanageable form of disease. Very early repeated small bleedings and purgatives, followed rather rapidly by wine and nourishing diet, at times check it. Their effects, however, are more prophylactic than remedial, this secondary affection being fairly established, the patient's fate is sealed.

3. *Affections of the lungs.* Experience has proved that secondary chest affections, so far from being rare, as I at one time imagined, are very frequent. They may be divided into 1st. Congestion. 2d. Bronchitis. 3d. Congestion and Bronchitis combined. and 4th. Pneumonia. It seldom happens that a patient escapes from severe collapse, without experiencing more or less posterior pulmonary congestion. It seems to consist simply of an accumulation of blood in the vessels of the parenchyma, without destruction of texture, or effusion of fluid into the air cells. Its existence can only be ascertained by percussion and auscultation, and the only indications which I have found are dullness of both, and occasional bronchial respiration. It is much more common on the right than the left side. It is probably caused partly by deficient enervation, and partly by the patient's lying almost constantly on his back, at a time when the heart's action is very feeble, and the thickened state of the blood renders its circulation through

the capillaries of the lungs difficult. The patient does not complain of pain. The tongue is dry and rough, the pulse frequent, and the stethoscope, which in the secondary fever of cholera, ought to be most assiduously employed, discovers the indications already-mentioned. Repeated bleeding to five or six ounces, cupping between the shoulders, mild purgatives, (seidlitz powders,) gentle sudorifics, (spt. mendererus and antimonial wine,) and small doses of mercurials, are the remedies on which experience has taught me to place most reliance. Copious bleedings have appeared injurious in almost all forms of secondary fever, and I think I have produced much better effects from five or even seven bleedings of five or eight ounces each, than one or two of fifteen or twenty. The muriate is the mercurial which I have lately been in the habit of using. One grain dissolved in an ounce of tinct. cardom. comp.; the dose half a dram to a dram, three or four times daily. The safety of the patient depends on ascertaining early, the nature of the affection, by means of the stethoscope, and losing no time in employing the appropriate remedies.

The presence of bronchitis, in its early stage, can only be ascertained by the stethoscope. The remedies most useful are nearly those above-mentioned. Excessive languor and listlessness are common symptoms. Depletion does not require to be carried so far as in the last case; sudorifics and quinine are beneficial towards its termination.

Little requires to be said of posterior congestion combined with bronchitis, except, that the cases require earlier and more energetic treatment, and are necessarily more fatal. At times they run their course with amazing rapidity. Of this, the following is an example:

Christina Smith, æt. 28. (Case 1048.) 12d. October, 1832.*—Was admitted at 6, A.M., with pulse scarcely perceptible, after only two hours' illness, cold tongue, cramps, but the surface still warm and perspiring. No treatment previous to admission.

To be placed on steam couch. Enema ex. tinct. opii g. xxx.

10, A.M.—Pulse 120, distinct, perspires very copiously, warm; stools in bed, &c.

Continue on steam couch, and encourage perspiration.

The purging returning, the enema was repeated, (perhaps improperly,) and the case assumed the form of bilious discharge, with excessive and constant irritability of stomach. The usual remedies were employed, but the irritability was very little relieved, and she continued in other respects convalescing. On the 7th, at 11, A.M., the stomach was more quiet, and the purging had ceased. Soon after

* I give this case, although not included in the numerical statements, as the symptoms were well marked.

the visit she became suddenly worse, and at night the following report was taken:—

7th. 10, P.M.—Becoming delirious, head was shaved, and towards afternoon respiration being found nearly absent on right side, was bled to ζ xij., blood, deeply buffed, respiration posteriorly on both sides very dull, on left sibilous; anteriorly on left side bronchial, on right mucous, loud, and heard without stethoscope. Pulse 90, not strong, tongue foul, rather cold. Stomach again rejects every thing swallowed. Stools copious, bilious; cough without expectoration.

Repetat. v. s. ad. ζ v. vel pro effectu.

R. Calomel. \mathcal{Dj} .

Pulv. ipecacuan. gr. iiss.

opii gr. $\text{v}\frac{1}{2}$ m. & divide in pulv. v. aq .

quor. s. l. 3tia q. q. hora. Habt. mistur. carbon. ammon. ζ i. o. hora.—Pector. applic. vesicat.

8th. 11, A.M.—Pulseless; mucous râle loud; tongue cold. Died in afternoon.

Inspection. 9th. 5, P.M.—Lungs weighed thirty-two ounces; right lung engorged, especially posteriorly, not hepatized, nor texture broken down. When pressed, frothy mucus and dark blood issued in considerable quantity from cells and vessels. Mucous membrane of bronchial tubes continuously vascular, of a deep purple colour. Left bronchial membrane almost perfectly healthy. Heart soft, right side filled with dark semi-coagulated blood.

The above is an instance of secondary congestion, and bronchitis of right side, terminating fatally in little more than twenty-four hours.

I can add very little to what I said in last report, regarding pneumonia. Its termination when extensive, has been almost always fatal. Its treatment when early ascertained, is nearly that recommended for the last two affections.

4. *Affections of the Heart.*—While I was making out the last report, I set down increased action of the heart, as a distinct affection, but on examining the daily reports of the cases, I found that almost all those patients in whom this symptom had been well marked, had died comatose, and I deferred classing it as a distinct affection, until authorized by farther experience. Attentive observation has convinced me, that although the majority of such cases do die comatose, the coma seems intimately connected with the increased impetus of the heart, and also that a few recover without passing through head affections. In the majority of cases of reaction after severe attacks, the heart will be found to beat more powerfully than natural. In very many this gradually subsides, more especially if the diarrhoea continue moderate and bilious. In others the impetus goes on increasing, is very strong to—

wards the left side of the sternum, and lower end of that bone, and is heard over the whole chest. At this period the morbid state of the heart's action may consist simply of increased impetus, or of this combined with the bellows and crackling sounds. The latter was rather new to my ear, and struck me as resembling a combination of increased impetus with the pulmonary crepitant râle. I was, however, in the end, satisfied, that it was referrible to the heart. The impetus soon becomes distinctly visible externally, and the larger arteries, especially of the neck, are seen to pulsate very powerfully. The pulse becomes full, hard, and jerking, seldom exceeding 90 or 100 in the minute. The surface is warm. The tongue dry, red, and polished. Drowsiness succeeds, and, if the remedies employed fail to relieve, goes on increasing, until it terminates in profound stupor, and loud stertorous breathing. In others it continues moderate, but so far as my observations go, whenever very deep sleep supervenes, death is the certain result. In many cases these symptoms are combined with copious bilious discharges, particularly by stool. The respiration is deep and slow, and the stethoscope generally discovers congestion and slight bronchitis, the former most common on the right side posteriorly, the latter on the left. If recovery take place, the action of the heart continues long excited, and the patients leave the Hospital with the impetus visible externally.

The following case illustrates the disease, and the mode of treatment found most successful.

William Monro, (case 893) æt. 22, carpenter.—Previous health and constitution good.—Was admitted at 11, P.M., August 15th, after labouring under premonitory and acute symptoms of nearly thirty hours' continuance. Pulse 60, of good strength. Discharges ceased. No cramp, acute pain in right side. Had taken about a scruple of Dover's (Stewart's) powders in divided doses before admission. *Eight ounces* of choleric blood were drawn, a sinapism was applied to his side, and he had a little Dover's powder with calomel.

17th. 9, P.M. Again bled to vij. oz. Pulse 108, of good strength. Face flushed. Very sleepy. Impetus of heart increased. Tongue white, dry. No stool.

Repet. v. s. ad. viij. oz. Abradant. capill. Hab. ol. Croton. gt. i. o. h. donec plene, &c.

18th. 10, A.M. Free fluid, bilious purging from one drop of oil. Less soporose. Coagulum of blood soft. Action of heart same.

Repet. v. s. et. ol. Croton.

It would be tedious to detail all the reports, which are very full. He was bled and freely purged on the 18th and 19th, and had cold lotions to his head. Again bled on the 21st to six oz., on which day the report says, "impetus of heart increased, now visible externally; drowsiness gone, intellect correct." 22d, impetus of heart not being

diminished, twelve leeches and a blister were applied to the cardiac region; he was ordered digitalis. 24th, urine very free. 26th, impetus of heart more moderate. 29th, cured. This man was six times bled, once leeched, twice blistered, very freely purged, had digitalis, and was allowed drink *ad libitum*.

Post mortem examination throws very little light on the proximate cause of this singular affection. No morbid appearance has been found so uniformly present, as to justify me in placing it towards the symptoms in the relation of cause and effect. The heart is always normal, and if the disease terminate early in death, is found full sized, and its left ventricle powerfully and firmly contracted; partial congestion of the lungs, particularly of the right, is frequently met with. The brain almost always unusually firm, at times remarkably so, and the mucous membranes may present almost any of the secondary appearances seen in these textures. In one case Brunner's glands were developed in immense numbers, in another Peyer's.

Some light may be thrown on this subject by the fact, that the affection is most frequent among robust, adult, and young men, and is met with also in cases which, though well marked, had not been excessively severe. I am inclined to refer the increased impetus of the heart to a deteriorated and thickened blood, exciting a powerful but previously healthy organ to excessive overaction, and the subsequent stupor to the effect produced on a weakened brain, by this blood being propelled through its vessel with morbid and unaccustomed violence.

The treatment consists in early and frequently repeated small bleedings. To do good, however, the lancet must be very early employed. My present practice in almost every severe case of cholera, more especially if the patient be young and robust, consists in opening a vein the moment that reaction is so far established as to allow the blood to flow; and to repeat the operation as often as the symptoms demand. The *modus operandi* of blood-letting is sufficiently obvious. Purgatives are useful when exhibited very early, and probably most so in those cases in which there is an increased secretion of bile. Late in the disease they are hazardous, tending to over-excite the liver, irritate the mucous membranes, and exhaust the patient, by a diarrhoea frequently quite beyond control. As a mercurial, I prefer the muriate in the doses already-mentioned. Gentle sudorifics, drinks *ad libitum*, and digitalis, make up the treatment. In several cases, I have lately tried oxalic acid in solution, I think with some advantage. At all events, given in solution, in doses of a sixteenth

or eighth of a grain, every second, third, or fourth hour, it does not act deleteriously. I expected that it might act as a sedative; future experience will show whether or not it possesses this quality.

6. *Excessive general irritation.*—I have added this secondary termination to those formerly sketched, because I have met with many instances in which it was obviously the cause of death, and because it appears referrible to a distinct pathological condition. Irritation in cholera may be divided into the primary and secondary. The primary appears during collapse, or at the time that rallying commences, and is generally owing to congestion of the lungs, or mucous membrane of the bowels, or accumulation of blood in the large vessels. It is hardly possible to conceive human suffering carried farther than in cases of this kind prolonged into faint re-action. In other cases the patient complains of unbearable local pain, generally referred to the region of the bladder, to which she (it is usually met with in females,) refers all her sufferings, attended with excessive restlessness. If re-action be established, she usually dies soporose. I have not been able to discover, by dissection after death, the cause of the excruciating local pain. The secondary irritation may perhaps admit of the explanation about to be given.

My chief desire in treating these cases has been to alleviate the present sufferings; opiate injections into the bladder or rectum, chiefly the former, opium by the mouth, prussic acid, and the warm bath, give temporary relief. Death is the ordinary termination.

Secondary irritation has appeared to me to depend on a different pathological condition from those alluded to, and to deserve a separate consideration. In this class, the recovery from a state of severe collapse is frequently rapid. The pulse becomes good, the tongue and surface warm, and the sensations almost pleasurable. Soon, without any apparent cause, the patient becomes irritable, by degrees excessively restless, sleepy, comatose, and dies. The symptoms vary somewhat; at times the restlessness is not succeeded by coma, and the patient expires in the act of throwing himself from bed. In a few cases he is maniacal and furious, kicking and biting the attendants. Recovery is very rare. The following cases will illustrate this affection:—

Phillip Phillips, æt. 64, (case 1003.) 12th Sept., 5 P.M. Is either delirious or insane, and can give no account of his previous symptoms, pulse feeble, irregular, respiration and surface pretty natural, will not show his tongue, purging continues. Mr Stirling who

attended this man previous to his admission, told me that the case had been one of well-marked and severe cholera.

Enema ex Tinct. opii gttss. XL.

9, P.M.—Little change, except that now furious swearing at, and kicking the attendants.

Abradant. capit. capill. Colli. nuch. imponat. vesicat. Hab. o. h. Vin. 3ij.

13th, *Mid-day*.—Less savage but still tied in bed, skin warmer, pulse 84, tongue dry and brown, teeth crusted, no urine, stools small, bilious.

Minuat. vinum. ad 3j, 2. q. q. h. Ol. ricin. 3ss. Catheterismus.

10, P.M.—Quite insensible, comatose, passes stools in bed, pulse 80, of good strength, intermittent. Eight ounces urine by catheter.

Cont. vinum.

14th, 10, A.M.—Alert and much more sensible and quiet. He improved till the 17th, when being threatened with bronchitis, he was bled to twelve ounces, and had a mild purgative. In the evening of that day the report is, "more restless, delirium returned, leaves bed and walks through the ward, pulse and tongue the same, no stool, urine free." He had a purgative, and the wine was continued. He became more rational, improved rapidly, and left the hospital on the 20th.

Robert Fairlie, æt. 13.—Monday, Sept. 17th, 9, A.M.—The length of this Article forbids my giving the reports in detail, suffice it to say, that he was admitted in collapse, that before evening the symptoms of that stage had passed off, the pulse being of tolerable strength, and secondary irritation already begun, he was bled, leeches, had warm bath, opiates, calomel ipecac. and opium powders, mild purgatives when required, and a blister to the nape of his neck. Nothing relieved him, the prominent notices in the daily reports, are, "excessive irritability, restlessness, and peevishness, with so incessant a desire to leave his bed, as to make it necessary to tie him in it." At 5 P.M. of the 21st, he died.

Sectio cadaveris, 19 hours after death. Head.—Skull adhered with great firmness to dura mater. On cutting open the membranes both folds of arachnoid were found perfectly dry. Meningeal vessels nearly natural. Substance of brain tolerably firm, not unusually bloody. Ventricles contained almost no fluid, (less than natural.) Substance of cerebellum seemingly sound. Internal cineritious substance appeared rather unusually soft. The whole course of sympathetic nerve, including all its ganglia, with the exception of one or two of the sacral, and a great many of its branches, particularly the cardiac nerves on both sides, were very carefully examined, and found quite healthy. The same care was taken with a great part of the 8th, and with the same results. Heart and lungs normal in weight and texture. Mucous membranes very carefully examined; were found considerably increased in vascularity, with threatened ulceration at some points. Other organs normal.

The peculiarity in this and other similar cases which I have carefully examined, is the firmness of the brain, the

dryness of its membranes, and the small quantity of fluid contained in the ventricles. Magendie, by drawing off the fluid which fills the ventricles in a normal condition of the brain, has proved, that it acts a useful physiological part, and in certain quantities is nearly essential to the proper performance of the functions of the organ. When drawn off, symptoms analogous to those above described are produced, which disappear as the fluid is re-supplied. I am inclined to think, from comparing the state of the brain in collapsed and secondary cases, that in the former the brain is more moist, and contains more fluid than natural, and hence, coma is a very common symptom before death. If reaction follow, the increased quantity of fluid is taken up, but on account of the great demand in the system for fluids, the absorbents overact, and the whole is carried into the circulation. Hence, the excessive firmness of the brain, in some cases, the dryness of its membranes, and the small quantity of fluid in the ventricles, and on the spinal marrow in others, and hence also, the distressing and fatal train of symptoms above detailed. I am inclined to think, that the same reasoning applied to other diseased conditions of the brain, might throw some light on the hitherto obscure pathology of this important organ.

From the above theory, wine in moderate doses, the warm bath, drink *ad libitum*, and nourishing soups by the stomach and enema, are the means most likely to succeed. All who saw Phillips, were struck with the sudden change which took place on him from coma, and restlessness, to comparative alertness and sensibility.

7. *Continued suppression of urine.*—On this subject I have very little to add to what was stated in last report. The cause of the suppression is still unascertained; probably it must be sought for partly in deficient enervation, but principally in the altered state of the blood. The typhoid delirium and coma seem to depend on the inactivity of the kidneys. I have not yet discovered a cure.

I must conclude this already too long report, without detailing, as it was my intention to do at some length, the morbid appearances found in the different stages of cholera, also the results of my experience of individual remedies. If the subject retain any interest, other opportunities may present themselves.

I beg to offer my best thanks to Mr. Winn, member of the College of Surgeons of London, and Mr. George Gardner of Glasgow, for their kind assistance in making up the numerical statements of this report.

highest of its membranes, and the small quantity of fluid contained in the ventricle. We generally by drawing off the fluid which fills the ventricle in a normal condition of the brain, has proved that it acts a useful physiological part, and in certain quantities is nearly essential to the proper performance of the functions of the organ. When drawn off, symptoms analogous to those above described are produced, which disappear as the fluid is re-supplied. I am inclined to think, from comparing the state of the brain in collapsed and secondary cases, that in the former the brain is more moist, and contains more fluid than natural, and hence, some is a very common symptom before death. It resorbs follow, the increased quantity of fluid is taken up, but on account of the great demand in the system for fluids, the absorption over, and the whole is carried into the circulation. Hence, the excessive pressure of the brain in some cases, the degree of its moisture, and the small quantity of fluid in the ventricle, and on the spinal marrow in others, and hence also, the distressing and fatal train of symptoms above detailed. I am inclined to think, that the same reasoning applied to other diseased conditions of the brain might throw some light on the pathology of this important organ.

From the above theory, when in moderate cases, the warm bath, drink, and nourishing soups for the stomach and spine, are the means most likely to succeed. All who are ill, and who were struck with the sudden change which took place in him from calm and restlessness, to comparative restlessness and sensibility.

3. Continued suppression of urine.—On this subject I have very little to add to what was stated in last report. The cause of the suppression is still unascertained, probably it must be owing to a partly in debility and anasarca, but principally in the altered state of the blood. The typical retention and some seem to depend on the activity of the kidneys. I have not discovered a cure.

I must conclude this already too long report without further notice, as it was my intention to do so some weeks ago. I have not yet been able to find any of the different stages of anasarca, who the results of my experience of individual remedies. If the next winter and winter, other opportunities are afforded to me.

I have to offer my best thanks to Mr. Wm. in which the College of Surgeons in London and Sir George Corneley of Glasgow, for their kind assistance in making up the medical statements of this report.



Cholera Morbus.

ADVICE TO FAMILIES.

For the Prevention and Cure of this Disease.

CLEANLINESS.—Personal Cleanliness is strongly recommended, and a careful removal of every source of Filth, which may render the air impure. Great care should also be taken to ventilate Rooms and Houses.

EXTERNAL WARMTH.—Warm Clothing is strongly recommended; especially thick warm woollen stockings. It is also recommended to avoid getting wet, or being much out at night.

DIET.—Indigestible articles of Diet, such as raw vegetables or undressed Fruits.—The diet should be regular as to time, and as nourishing as circumstances will permit. Some article of diet should be taken before quitting the house in the morning.

TEMPERANCE.—The abuse of Spirituous Liquors greatly predisposes the body to the disease, and tends to lessen the influence of remedial means; it consequently renders the disease more fatal. Temperance is therefore most strongly recommended.

SYMPTOMS OF THE DISEASE.—The disease is preceded by languor, coldness, giddiness, and slight bowel complaint. It usually comes on with purging, vomiting, and cramp; then follow smallness of the pulse, and coldness of the skin; the features become sharp and contracted; and the eye sinks.

REMEDIAL MEANS.—It is of the utmost importance that the early symptoms should be attended to, and medical assistance procured as early as possible; *but as the disease may occur under circumstances where medical advice cannot be immediately obtained*, the following measures may be safely and beneficially employed:—All means tending to restore the circulation, and maintain the warmth of the body, should be had recourse to, without delay. The patient should always be immediately put to bed, wrapped up in hot blankets, and the warmth of the body should be sustained by the application of bags, containing hot sand, salt, bran or meal, to different parts of it. For the same purpose, stone or glass bottles, jars, tin canisters, or other close vessels of that kind, filled with very hot water, should be employed. Two tea-spoons full of the flower of mustard-seed mixed with half a tumbler of warm water, to be given to excite full vomiting; afterwards, a wine-glass full of brandy or whisky, mixed with hot water, will be useful. If the disease continues, from 20 to 40 drops of laudanum may be administered, along with two tea-spoons full of magnesia in peppermint water. If there be pain of the stomach, a mustard poultice ought to be applied over it. Should the symptoms not abate in an hour, or an hour and a half, the draught, with laudanum, may be repeated.

Families are recommended to have always in the house, mustard powder, a little whisky, laudanum, and a few small bags, ready to contain heated sand, &c. The sand or salt may be heated upon a shovel or girdle.

1890-1891

